GENETIC SCIENCE AND ITS CONCEPT IN ISLAM

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Abstract
One of the blessings of Islam is that it never abstracts scientific programs or narrows the scope of the mind in the field of Science and technology. Unlike other religions, there is no conflict between Science and religion in Islam. Christian clergy opposed Scientists, thinkers and pioneers of technology that we take for granted today. Many were punished, tortured and sentenced to death. The Qur'an shows that ALLAH, Almighty, bestows many gifts on mankind enabling them to discover the mysterious nature around them and to recognize the laws that control the universe. (Qur'an, 55:13) ALLAH Almighty also submits the whole universe with its heavens, earth, sun and moon to mankind. (Qur'an, 2:22) And also no one can say that the Qur'an is a scientific book but we saw all through this book takes place which has the biggest claim and most extraordinary signs. (Qur'an, 53:41) These all signs throughout the book present that the Qur'an, s claims are true. In these signs of universe most important sign is named genetic science that gives us many ideas and researches about human creativity and also universe.

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1- The Definition Of Genetics:
The branch of biology dealing with heredity and variation: inherited characteristics of an organism; origin: development, genetic code: the system by which genes pass on instruction that ensures transmission of hereditary character, (1)
   1) The Science that accounts for natural difference and resemblances among organisms related by descent.
   2) The study of heredity and its variation. (2)

2- Holy Qur'an Discuss Genetics Science
Qur'an has revealed absolute facts about Genetics in its true perspective some 1400 years ago.
   Mankind, fear your Lord, who created you of a single soul, and from it created its mate, and from the pair of them scattered abroad many men and women; and fear God by whom you demand one of another, and the wombs; surely God ever watches over you (3)
O humanity! Adhere to the Laws of your Sustainer who initiated your creation with a single life-cell (4) which split into two parts – one male and the other female – and through them spread so many men and women in the world and follow the Laws of Niz’am-e-Rabubiyyat. The first step, while establishing this Niz’am, would be with your own kith and kin and if you succeed in doing this, you will see how Allah’s Laws continue in keeping watch over you!
   Was he not a sperm-drop spilled? Then he was a blood-clot, and He created and formed, and He made of him two kinds, male and female (5)
Then in the mother's womb He formed it into an embryo that was suspended and by various combinations, and fashioned it into an excellently proportioned shape; Due to its distinction into sexes, male and female were paired.

_We created man of an extraction of clay, then We set him, a drop, in a receptacle secure, then We created of the drop a clot then We created of the clot a tissue then We created of the tissue bones then We garnetmed the bones in flesh; thereafter We produced him as another creature. So blessed be God, the fairest of creators! (6)_

The great possibilities which Allah's Law of creation has:

_We created man of a sperm-drop, a mingling, and we made him hearing, seeing.) (7)_

It is a fact that the human being was for a long time not something which could exist on its own. During this process, one of the stages was the initiation of his creation from a sperm. It was a collection of numerous mixed potentialities; and so we made arrangements whereby his latent potentialities would develop gradually. For this, while in the mother's womb, it underwent many changes till it became a human being capable of hearing and seeing.

_He created you of a single soul, then from it He appointed its mate; and He sent down to you of the cattle eight couples. He creates you in your mother's wombs creation after creation in threefold shadow. (8)_

He initiated your creation from a single living cell and then caused it to split into two parts, one becoming the male and the other female. He also created eight types of cattle. When you are still in the mother's womb, He fashions you, inculcating creative changes in different stages. (9) These changes constitute one act of creation after another; and all this takes place under three veils of darkness. This then is your Allah, according to Whose Laws of Rabubiyyat your development and nourishment take place. He alone wields total authority and power in the universe. No one else has such power or authority.

_O Man! What deceived thee as to thy generous Lord who cr eated thee and shaped thee and wrought thee in symmetry and composed thee after what form He would? (10)_

3- Sunnah Discuss Genetics Science

The Hadith were recorded centuries before modern science is consistent with the principles of human genetics. Certainly, specific scientific knowledge regarding these topics was not available in the 7th century, when the Hadith was written. Several citations in the Sunnah are consistent with the existence of different genetic mechanisms that are now known to be responsible for normal and abnormal human development.

The Known genetic mechanisms include:
1) Abnormalities of chromosome number or structure.
2) Mutations at a single genetic locus (Mundelein)
3) Cumulative effects of several genes (polygenic), all acting to produce a single phenotype. (11)

4- Genetic Control Begins At Conception:

Only when the zygote forms can the genetic contributions of both parents actually are determined. The genetic programming, including sex determination, occurs in the nutfah stage, as the Qur'an states:

"He created him from nutfah and immediately planned or programmed him" (12)

_Taqdir is the noun form of qaddara that means programming or planning. (13) Fa is a conjunction which indicates that programming occurs immediately after the fertilization. (14) Ibn Abbassaid that "fa qaddarah" means planned his hands, legs, eyes, all different organs. (15) Thus, programming can be completed only after fertilization; if both parents are heterozygous will their offspring is affected. We also know that the expressivity of dominant genes is not determined until the time of conception, for not until then is presence or absence of modifying genes determined.

A specific example is derived from sex differentiation which becomes programmed by genes during Nutfah, but manifested only later on.
According to the previous verse, the nutfah which is refers to the sperm. Sex determination primarily occurs at fertilization and depends upon the type of sex chromosome in the sperm which fertilizes the ovum. An X-bearing sperm results in the formation of a female individual, whereas, a Y-bearing sperm results in the formation of a male individual. However, the sex of the new individual cannot be correctly programmed without the contribution of the X-chromosome of the ovum, even though participation of X and Y bearing sperms are necessary for sex determination. In another words, although the Qur'an refers to the source of difference in sex of offspring, yet the responsibility for that process involves sharing of x- chromosome of female. (16)

5- Mundelein Mechanisms:
The plural nature of nutfah amshaj is consistent with existence of different genetic mechanisms, even within the single category of single gene (Mundelein) mutations. There are references in the Sunnah to several different specific single gene mechanisms, namely both recessive and dominant inheritance. A potential allusion to recessive inheritance would appear to exist in the following Hadith:

Narrated by Abu Hraira RAA a Man Came to the prophet SAW and said: O Allah’s Messenger! A Black child has been born for me, the prophet SAW asked him, and have you got camels? The man said, yes, the prophet SAW asked him, what color are they? The man replied: Red. The prophet SAW said: Is there a grey one among them? The man replied, yes the prophet SAW said: Whence comes that? He said: May be it is because of heredity. The prophet SAW said: may be your latest son has this color because of heredity. (17)

Two conclusions can be drawn from this Hadith

First, the laws of heredity are similar between man and animals.

Second, a characteristic which becomes hidden for several generations may appear again in the future.

Comment: it contains basic facts of genetics that is a modern science. At the time of revelation, there was no science dealing with this issue, what source that could give such data to Prophet Muhammad to that?

In another Hadith, the Prophet said:
"Oh, Allah, make us enjoy our hearing, our vision, our strengths, as on as we live, and make it our inheritor." (18)

6- Polygenic Inheritance:
Most normal variation is due to polygenic inheritance, by definition multifaceted and plural in nature. Neither chromosomal nor Mundelein mechanism can readily explain the genetics of normal anatomic and physiologic variations. On the other hand, the tendency of relatives to resemble one another in physical appearance is obvious. Moreover, most congenital anomalies show some heritable tendencies.

Monozygotic twins are much more likely to be concordant for any given anomaly than are dizygotic twins. Since the same intrauterine environment, genetic factors must be invoked to explain the differences. (19) On the other hand, monozygotic twins show less than 100% concordance for common traits, indicating existence of environmental as well as genetic factors.

The logical explanation for familial resemblance is that a single trait is influenced by several genes. As the number of genes controlling a trait increases, the number of genotypic classes increases even more. A trait controlled by more than one gene is said to be inherited in polygenic fashion. If environmental as well as genetic factors influence a trait, the term multifactor is used. Polygenic and multifactor inheritance usually cannot be distinguished from one another in humans, although comparisons between monozygotic and dizygotic twins theoretically permit such a distinction. Polygenic/ multifactor inheritance is invoked to explain the inheritance of normal anatomic and physiologic variables that display continuous variation - height, skin color, hair color, blood pressure, age of menarche, ability to metabolize a given drug or toxin. (20)

In discontinuous variation, the population consists of two discrete groups, one affected and one unaffected.
Implications concerning inheritance in the ahaa'dith:

- The unusual case of the dark-skinned child born to light-skinned parents could be explained as an anomaly which occurred due to some aspects of polygenic inheritance discussed here.
- The Prophet is asking God that normal functioning of our senses and abilities be inherited to our future generations as expressive traits or phenotypes. These functions and abilities, as well as the aging process as indicated when the Hadith asks that these characteristics continue "as long as we live," are traits which would likely involve polygenic/multifactor inheritance. Therefore, the Hadith is a request that within the combination of genetic material transferred to the offspring, the per cent of genes related to some sort of deficiency in functioning or abilities would be low, and that any environmental factors influencing an anomalous, detrimental expression of the genes would also be limited, in order that the desirable characteristics would be expressed. (21)

Narrated by ibn Mas'ud (razi allah unhu) he said:
Verily the creation of each one of you is brought together in his mother's belly for forty days in the form of seed, then he is a clot of blood for a like period, then a morsel of flesh for a like period, then there is sent to him the angel who blows the breath of life into him and who is commanded about four matters: to write down his means of livelihood, his life span. His actions, and whether happy or unhappy. By Allah, other than whom there is no god, verily one of you behaves like the people of Paradise until there is but an arm's length between him and it. And that which has been written overtakes him and so he behaves like the people of Hell-fire and thus he enters it; and one of you behaves like the people of Hellfire until there is but an arm's length between him and it. And that which has been written overtakes him and so he behaves like the people of Paradise and thus he enters it. It was related by al-Bukhari and Muslim, (22)
This Sunnah deals with the creation of human beings which is mentioned in great detail in Al-Qur'an. However, the astounding and astonishing matter about this Hadith is the angel who blows the breath of life into man and writes down four matters: (1) His means of Livelihood, (2) His life span, (3) His actions, and (4) whether happy or unhappy. (23)

Before the scientific discovery of the Genetic Code and the award of Nobel Prizes to the three discoverers in 1968, it was humanly impossible to scientifically understand this Hadith. In 1990s, we are able to unravel the genetic code with regard to a person's inheritance of certain disease carrying genes. Inside the nucleus of a living cell there are 46 chromosomes which are visible only when the cell divides. (24)

7- Benefits Of Genetic Science:
Some benefits of genetics science are below in Animals and plants except humans:
A. fish have been cause to changes in hormones that accelerate growth in several laboratories.
B. honeybees and other beneficial insects engineered to tolerate pesticides.
C. bacteria have been to produce rennet, an enzyme important in making cheese.
D: crops would be developing seeds with certain predictable characteristics.
E: Plants able to produce more high quality protein, with increased per-acre yield, without increasing the need for expensive machinery, fertilizers, or water
F: the seeds would be cheap and freely available without restrictive licensing.
G: Genetically engineered cotton fast growing trees provide lumber, pulp, fuel and shade.
H: Rice strains are disease-resistant.
I: Genes of fish have been placed into potatoes and strawberries to make these plants more resistant to cold weather.
J: sheep with skin that provide immunity to insect parasite.
K: Heal diseases.
L: Screening unborn babies refers to screening for genetic disorder would give prospective parents more option in dealing with their infant problems.
M: the pharmaceutical of genetic Science engineering will open tremendous vistas in treatment of many illnesses and the possibilities in agriculture and animal husbandry might be the clue to solving the problems of famine the world over.

N: Geneticists now say that diabetes, hypertension, and cancer run in families. In other words these diseases are genetically inherited.

O: Geneticists can treat adults for the presence of a handful of relatively rare genes - among them those that cause Huntington's disease; adult polycystic kidney disease; hemochromatosis; and certain forms of cancer, some leukemia's, and small-cell carcinoma of the lung. (25)

8- Definition Of DNA:
A complex protein of high molecular weight consisting of deoxyribose phosphoric acid, and four bases. It is a nucleic acid present in chromosomes of the nucleic of cells and is considered the chemical basis of heredity and the carrier of genetic information. (26)

The chromosomes are made of DNA. A certain length of the DNA is called the gene. That length of DNA that codes for complete synthesis of a protein is also called a gene. Along the 46 chromosomes of every human cell are some 100,000 genes.

There are two types of tests and their causes:

1- prenatal tests is inform future parents of a child's chances of inheriting a condition for which the parent is a carrier-Tay-Sachs disease, sickle cell disease, cystic fibrosis- or of inheriting a condition from which a family member has already died-muscular dystrophy, hemophilia, and beta-thalassemia

2- Genetic screening tests tell the adults about their own genetic destiny. (27)

9- Embryonic Stem Cell:
Embryonic stem cells come from a fertilized egg less than a week old. The embryo forms a structure called a blast cyst Consisting of merely 140 cells, this hollow, fluid-filled sphere is made up of two types of cells: Those which form the 'shell' of the sphere and those located within the 'shell.' Is an embryo at such an early stage considered a human life in Islam? Dr. Najim says:
"...the embryo had been considered as respected since time of fertilization but to be considered as human being only after two weeks of fertilization i.e. after implantation so they accept all types of contraception during such period such as IUD which will not allow implantation to occur." (28)

"The Seminar agreed that genetic engineering may be used in the prevention, treatment or alleviation of diseases, whether in the form of genetic surgery in which genes are replaced by other genes or genes are implanted in the patient's cells, or when genes are planted in another body to obtain larger amounts of the same gene to be used in the treatment of certain diseases." (29)

There are other means to acquire stem cells to use in treatment of diseases. One of which is the use of cord and placenta blood. The bloods of these two sources are rich in stem cells and are currently being used to treat a wide variety of diseases. Blood can be banked privately by a family, or in some areas it can easily be donated for use to others. This option is perfectly halal for all Muslim couples who wish to either bank or donate the umbilical and placenta blood. However with infertile couples this may not be an option for donation.

10- Some Important Issues:

CLONING
The word cloning essentially means to copy or to duplicate. It means a process whereby the genetic material from the nucleus of an adult donor cell is transferred to a female reproductive cell of the same species from which the original genetic material of the nucleus has been removed.

Two issues regarding cloning according to Islamic view:
First: Allah's attribute as the creator in any way?
Second, should it be permitted?
ALLAH is the creator of the universe but He has established the system of cause and effect in this world. Cloning is a cause and only through Allah's will it can produce the effect. Cloning is permissibility in case of plants as well as in case of animals except human beings. A fully fledged use of cloning technology is haram because it may cause three major problems:

Cause danger to the human personality, to human dignity and honor and to human family and society?

SKIN GRAFTING
It is a surgical procedure by which skin substitute is placed over a burn or non healing wound to permanently replace damaged or missing skin or provide a temporary wound covering. Skin grafting serves a critical function in the healing process for a variety of different injuries to the skin. Serious skin results in serious scarring.

Burns, diabetic ulcer, venous ulcers, pressure sores there are three potential sources of a skin graft. Grafting skin can be obtained from another area of the patient's body. Following condition are necessary for the permissibility of skin grafting.

1. the skin transplantation is the only effective method of treatment.
2. the harm caused to the donor, in case of donation, by the process of removal is within the standard acceptable limits.
3. the operation is promising.
4. the skin is not acquired by sale, intimidation or deception.

PLASTIC SURGERY
Plastic surgery means when something does not look right or something is missing or something has been destroyed or deformed. So it is regarded as cosmetic surgery because it results in improved appearance. There is no doubt that faults and scars that cause physical and psychological pain and harm, therefore Islam allows people afflicted with them to remove or reduce them by surgical means. They cause to remove the mental and psychological pain that allow this surgery as an urgent need, where necessity permits something that is ordinarily forbidden. To understand the difference between what is permitted and what is forbidden. Muhammad (PBUH) says:

Allah has cursed the women who make tattoos and the women who have this done, the women who pluck facial hair and the women who have this done, and women who widen the gap between their own or others teeth for the sake of beauty, changing what Allah has created (Al nassai, Sunan, maktab ul tarbiya alarabi, berut, 1988, kitab al zinah, chapter No-18, Hadith-3720)

GENETIC FINGERPRINT
Genetic fingerprint is a unique pattern of genetic structure reflected in each cell of every individual of either sex. This is not shared with and other human being at any time and is a categorical proof of biological parentage and identity, particularly for the purposes of forensic medicine the finger prints system at borders, criminal investigation cells and immigration centers prove the fulfillment of this Qur'anic prophecy.

It has a better claim to be considered as valid evidence, ahead of qiya'ah, and should be accepted as evidence in cases of dispute over the parentage of person with unknown parentage.

GENE DIAGNOSTICS
Gene diagnostics are used in the medical field for various purposes, which must be differentiated in a discussion about the Islamic arguments of these processes. Prenatal research covers prenatal diagnostics or chorine biopsy, and pre-implantation genetic diagnosis. Newborn screening tests, genetic tests, diagnosis of heterozygote's, and pre-symptomatic diagnostics are post-natal tests.

GENE THERAPY
Gene therapy covers the treatment of a genetic disease by intrusion into the concerned section of the genome. The processes used in gene therapy are at this time marred by various technical problems regarding the efficiency and controllability of the duration of the effects and are still in the experimental
stage. Genetic research on human embryos is part of medical research in general and the Islamic and ethical requirements and rules of medical research should apply.

GENETIC COUNSELING

Genetic counseling is aimed at providing accurate knowledge, predictions, and statistical probabilities, while the decision is left entirely to those concerned and between them and the treating physician, without any attempt to influence events one way or another. The Genetic counseling service should be made widely available to families or prospective married couples. Health authorities are called upon to increase the number of human genetics units to provide specialist physicians to give genetic counseling and widen the range of health services provided to pregnant woman in the field of diagnostic and treatment genetics with the aim of improving the health of childbearing. No-one must be forced to undergo genetic counseling. (32)
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